

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Helou, Elie JR. et al.

Serial No.: 10/608,441

Filed: June 27, 2003

For: METHOD FOR USE IN BAKING  
ARTICLES OF MANUFACTURE AND  
MOLD FOR USE IN SAID METHOD

Group Art Unit: 1791

Examiner: Nguyen, Thukhanh T.

I hereby certify that this correspondence  
(along with any documents referred to as being  
attached or enclosed) is being deposited this  
14<sup>th</sup> day of July 2006 with the United States  
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DECLARATION OF ELIE HELOU JR. UNDER 37  
CFR 132Commissioner for Patents  
P.O. Box 1450  
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Sir:

I, Elie Helou Jr., declare:

1. I am one of the named inventors of the above-referenced application. I am an engineer with 12 years of experience in the advanced aerospace composites industry and an additional 10 years of experience in the biodegradable rigid packaging industry. I am the CEO of Biosphere Holdings Corporation. I am also the current CEO of Biosphere Industries LLC, the assignee of the present patent application, which is a joint venture between Sealed Air Corporation and Biosphere Holdings Corporation established to commercialize our unique green packaging technology.

2. In manufacturing the claimed mold apparatus having a gap with the claimed dimensions, I have satisfied a persistent and recognized long felt need for a

more efficient mold apparatus that creates a finished article devoid of the weak points present in molded articles created by existing mold technology, without a significant loss of material or waste during the production of such articles, and which also minimizes excess manufacturing steps.

3. The baking mold industry has for many decades used a technology based on heated molds with relatively large vents to produce molded articles (e.g., ice cream cones, wafer cookies, etc.). The vents are required first to permit the escape of air as the mold is filled and then to allow the escape of steam as the dough or batter bakes. However, in the existing technology, the vents are large enough that dough or batter is always expelled along with air and steam. This technology has therefore always produced articles with stems or flashings or other similar features that then need to be removed or trimmed in order to create the finished product. In some cases as much as 30% of the initial material deposited into the mold is expelled via these vents. The expulsion of material causes additional material and energy to be used, as well as creating weaknesses in the finished product, and thus requires additional manufacturing steps to be accomplished on articles at their weakest state, immediately after baking is complete. Furthermore, the use of fibers in the doughy mixture adds complexity in that the fibers strengthen the articles, and thus can cause localized defects at the trimming area unless the excess materials are trimmed very precisely. If the trimming process pulls on the stems, then the stems will tend to leave a crater or defect where the fibers have pulled additional material around the base of the stem. This tendency for the trimming process to remove more material than necessary leaves a defect(s) in the finished article. In almost all cases, the venting stems occur on the edges of the packaging, which is where the female and male molds split. This places the defects in the worst possible location, for example, at the edges of cups or baking containers.

4. The baking mold industry currently uses technology that requires mold articles to be die cut or trimmed, or requires necessary secondary step(s) which not only increases part rejection rates, but also creates weaknesses where the product is normally needed to be strong, e.g., at the edges and/or rims of products. Until the

development of the claimed invention, no one in the industry was able to produce finished articles without stems, spurs, or flashings ("or not molded products"), with no significant excess material loss, and no need for trimming or other post molding process steps to have a finished substrate. Packaging articles, which are made using mold technology, are some of the lowest priced articles in the market place today, and any reduction in the number of steps required to produce such articles is critical in reducing the manufacturing costs to commercially viable levels. Several companies have spent close to a decade each and several millions of dollars attempting to simplify the molding process without success. Thus, a long felt need exists for a mold apparatus that could avoid the aforementioned undesirable properties in finished articles without the significant production of excess material or waste and minimize excess manufacturing steps.


5. I was able to develop a mold that would not require secondary steps to produce the finished substrate or result in weakness in the finished articles, satisfying the long felt need for a more efficient and effective means to create molded articles. Over several months, the claimed mold apparatus was created and the required gap dimensions were found to be too small to be made using holes. This finding led to the development of the claimed mold apparatus having a substantially continuous gap with the claimed dimensions, which produces finished parts where no trimming is required because there is no significant escape of material. The claimed mold technology has allowed us to greatly reduce the capital equipment requirements and the complexity of our production line. Also, the claimed mold apparatus produces articles with stronger, nearly defect-free rims and edges that can be observed by comparing the handling characteristics of substrates created from standard molding technologies, which have weaker edges and may require the doubling of walls at the edges (e.g., as can be observed in existing ice cream cones), and parts created from the claimed molding technology. In fact, the ability to eliminate these secondary steps and to create relatively stronger products has allowed us to form a Joint Venture in the several millions of dollars range to commercialize this innovative technology.

6. In addition, because there is no significant escape of material in the claimed invention, problems with vent abrasion that commonly occurred with the old and existing technologies were eliminated, and the overall pressure inside the mold was also reduced. Further, the claimed mold gap technology has self cleaning properties which allow for a greater interval between mold cleanings. The claimed technology has also created an unusually large operational window, whereby functional products can be produced using a wider range of mix weights and formulations than is possible with the conventional or existing technology.

7. Thus, the claimed mold apparatus has satisfied a persistent and recognized long felt need for a more efficient mold apparatus that creates a finished article devoid of the weak points present in mold articles created by existing mold technology, without a significant loss of material or waste during the production of such articles, and which minimizes excess manufacturing steps.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: July 14, 2008

  
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Elie Helou Jr.